HAMPTON BEACH STATE PARK

Flagship Beach Report
Summer 2010

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Hampton Beach State Park, Hampton
Water Quality Report
Summer 2010

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History of the New Hampshire Beach Program

The New Hampshire Department of Environmental Services (NHDES) recognizes a public health threat may exist within recreational waters and tests the water at the state's beaches to ensure swimmers are not exposed to disease-causing pathogens or cyanobacteria scums. The NHDES has operated a Public Beach Inspection Program, commonly called the Beach Program, for over 20 years.

The New Hampshire coastal beach monitoring program was initiated in 1989 with the DES inspecting five beaches. In October 2000, the United States Congress amended the Clean Water Act to include the BEACH Act. The Environmental Protection Agency (EPA) was then authorized to award grants to eligible states to develop and implement monitoring and notification programs. These programs protect the public from exposure to pathogenic microorganisms in coastal recreation waters.

The DES first received grant funds in 2002. Since then the New Hampshire Beach Program has successfully met all of the EPA's performance criteria requirements (National Beach Guidance and Required Performance Criteria for Grants) and continues to expand the monitoring and notification program. Weekly summer monitoring throughout the state was conducted at nine beaches in 2002, and has since nearly doubled to 16 by 2010. The Beach program strives to expand sampling to include all coastal New Hampshire beaches.

Coastal beaches are monitored for the presence of the fecal bacteria Enterococci which are present in the intestines of warm-blooded animals including humans. Fecal bacteria, when present in high concentrations and ingested, can commonly cause gastrointestinal illnesses such as nausea, vomiting and diarrhea. These indicator organisms signify the possible presence of other potentially disease-causing organisms in the waterbody.

Beach monitoring and bacteria source tracking have been implemented to protect public health. In a collaborative effort, the NHDES Beach program, towns, beach managers, recreational directors and health inspectors encourage public awareness of sources of pollution and environmental responsibilities. Thank you for your interest and concern in New Hampshire's water quality.

Beach Overview

Hampton Beach is located just over the Massachusetts border and is less than an hour drive from the Maine border. North Beach, located on the northern side of Great Boar's Head, is also considered by some to be part of Hampton Beach State Park (Figure 1). The DES Beach Program only considers the main 7,740 feet of Hampton Beach State Park for this report. The sampling and data summary at North Beach is reported in a separate publication.

For the second straight year, Hampton Beach State Park was recognized by the National Resources Defense Council (NRDC) with a five star rating for its high level of water testing, water quality, and public awareness (Appendix A).

The State Park and town of Hampton coordinate a variety of activities at Hampton Beach during the summer months. Among these are the annual master sand sculpting competition, Seafood and Children's festivals, nightly entertainment at the Seashell Stage, and weekly fireworks displays. The aesthetic qualities combined with a great variety of family-oriented activities make Hampton Beach one of the most popular attractions on the seacoast.

Hampton Beach State Park has been operated as a public beach since 1935 and monitored under the DES beach program since 1986. An estimated 200,000 people visit the park each year. Due to Hampton Beach's size of almost a mile and a half and its popularity, the DES strives to make water quality and public health a priority. The DES Beach Program has adopted strict water quality standards for public beaches to provide a healthy swimming experience.

Coastal beaches are monitored for the presence of the fecal bacteria Enterococci which are present in the intestines of warm-blooded animals including humans. Fecal bacteria, when present in high concentrations and ingested, can commonly cause gastrointestinal illnesses such as nausea, vomiting and diarrhea. These indicator organisms signify the possible presence of other potentially disease-causing organisms in the waterbody.

Hampton Beach has never been issued an advisory. The water quality at the beach has remained relatively unchanged throughout the years. The average Enterococci concentration since 1992 (prior to that fecal coliform was measured) is 7.6 counts/100 ml. Although the water quality at Hampton Beach has remained stable, the region land use around it has changed dramatically. The area surrounding the beach has become increasingly urbanized. Urbanization results in increased impervious surface area which poses a number of threats to water quality through nonpoint sources of pollution. Increased stormwater runoff, sewer overflows, septic failure, and boat sewage discharges are potential pollution threats to Hampton Beach.

The Beach Program works cooperatively with the park supervisor, beach manager, municipalities, and the public to identify and reduce potential pollution sources to better protect public health at our Flagship Beach. Since 2008, the Beach Program has provided 34 cigarette snuffers, 42 large garbage cans, and five dog waste collection containers. Due to budget restraints, no new items will be purchased in 2011. However, continued cooperation between the coastal beach and beach inspection staff can produce litter awareness campaigns to encourage all beach goers to help keep NH beaches clean.

State Beach Ordinances

The Department of Resources and Economic Development has the following administrative rules that apply to all coastal state beaches:

1. Glass containers of any kind are prohibited.
2. Alcoholic beverages are prohibited.
3. Dogs are not permitted on state beaches at any time.
4. Horses are only permitted on Hampton State Beach from October 1 to April 30.
5. Digging holes is only allowed on beaches if the holes are less than 12 inches deep and completely filled in when done.
6. Fires and portable grills are prohibited.
7. Beaches are open from sunrise to 1 a.m.
8. Inflatables and other floatation equipment, life jackets, swim fins, face masks, diving goggles, snorkel tubes, and skim boards are not permitted.
9. Surfing is only allowed at designated areas of North Beach.
10. Garbage must be carried out.
11. Removing or destroying marine life is prohibited.

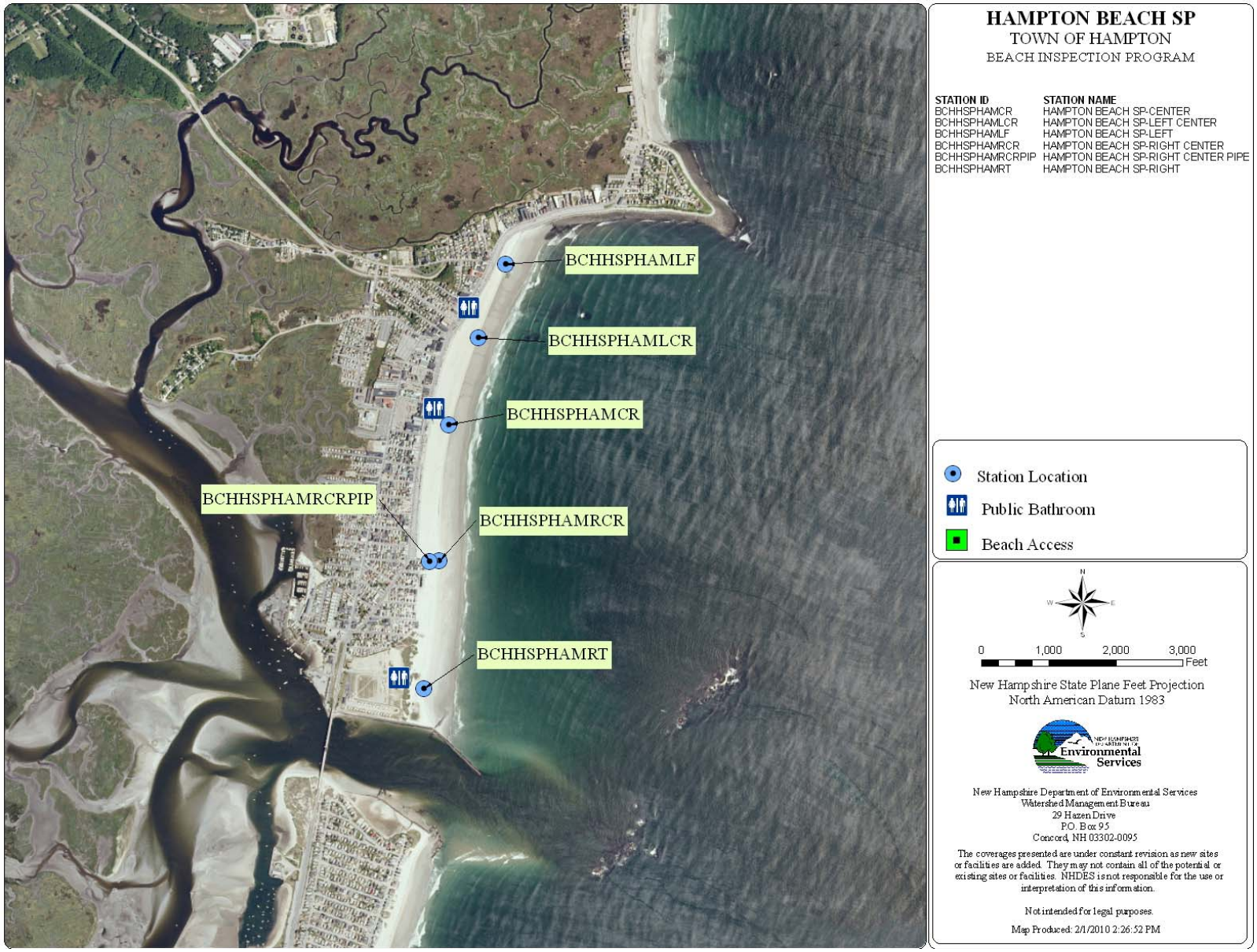

Figure 1. Hampton Beach State Park, Hampton, N.H.

Assessing Your Beach

Sampling Frequency and Location

In 2003, the beach program developed a risk-based evaluation process to determine how often a beach should be monitored. Beaches with increased potential impacts to public health are monitored more often than beaches with lesser impacts. Each beach is evaluated annually by the beach program on several criteria within three main categories: beach history, microbial pathogen sources, and beach use. Additionally, a beach that appears on the most recent 303(d) list as "not supporting primary recreational contact" is elevated to a more intense inspection schedule. The Federal Clean Water Act (CWA) requires each state to present a 303(d) list to the EPA every two years that indicates impaired or threatened surface waters due to a pollutant or pollutants. A coastal beach is listed if two or more exceedences of the state standard of 104 Enterococci counts/100 ml are measured during sampling in the last five years. Exceptions to the rule can be made if a large number of recent samples are all within the state standard.

Based on the evaluations, beaches are assigned a Tier I, Tier II, or Tier III status. Tier I beaches are considered "high priority" and have an increased potential to impact public health due to heavy beach use, previous elevated bacteria levels, potential bacteria sources to the beach, inclusion on the 303(d) list, or a combination of these factors. Tier II beaches are "medium priority" and Tier III are "low priority" beaches that have less potential to impact public health. Beach sample frequency is based on Tier status; Tier I beaches are sampled twice per week, Tier II beaches are sampled once per week, and Tier III beaches are sampled every other week.

The number of samples collected at each beach is determined by beach length. Beaches less than 100 feet are sampled at left and right locations one-third of the distance from either end of the beach. Beaches greater than 100 feet are bracketed into thirds and sampled at left, center and right locations. Routine sample collection may be enhanced by sampling known or suspected pollution sources to the beach area. Storm event sampling may be conducted at beaches where watershed runoff resulting from wetfall is expected to impact beach water quality.

Hampton Beach State Park is listed as impaired for primary recreational contact since five single sample results exceeded the Enterococci state standard during the swim season for the last assessment period. As mentioned earlier, the assessment period for the Surface Water Quality Assessment (SWQA) program spans a five year timeframe. Beach advisory protocol does evaluate all collected samples for a beach area when initiating an advisory while the SWQA program considers each sample that is above the state standard as a violation that places the area at risk for an impaired designation.

Based on past beach use, sample results, and 303(d) assessment, Hampton Beach State Park is classified as a Tier I beach indicating high priority and sampling is conducted twice a week. The frequency of sampling at the beach has increased since the launch of the beach evaluation process implemented for the 2003 sampling season. Sampling increased from once a week to twice a week in 2005 due to exceedences of the state standard for bacteria the previous summer. At Hampton Beach samples are collected at the left, left center, center, right center, and right stations regularly (Table 1). All stations are evenly distributed along the shoreline and can be accessed via the State Park parking lot or sidewalk area of Route 1A (Figure 1).

Table 1. Hampton Beach Station Descriptions and Latitude/Longitude Points.

Description	Latitude	Longitude
Right: The right sample station is accessed from the RV Camp parking lot at the southernmost section of the beach. The sample is collected straight out from the beach access of the picnic area.	42.898418°	-70.811115°
Right Center: The right center sample station is accessed from Haverhill Street off of Route 1A. The sample is collected at the beach in front of the storm drain. If the storm drain is flowing, collect samples from the flow as well.	42.903667°	-70.810167°
Center: The center sample station is located directly in front of the Main Park Office. The sample is taken from the end of the boardwalk access Seashell Stage straight down.	42.909249°	-70.809582°
Left Center: The left center sample station is located off of Route 1A. Collect sample in front of the New Hampshire Marine Memorial Statue.	42.912806°	-70.807861°
Left: The left sample station is on the northernmost section of the beach close to an area known as Great Boar's Head. The beach area is sandy and the sample is collected on the left side of a rock jetty.	42.915804°	-70.806301°
Right Center Pipe: The right center pipe is sampled if flowing water observed. The sample is collected from of the storm drain at the ocean end of Haverhill Street.	42.903639°	-70.810722°

Coastal Water Quality Standards and 2010 Results

Beaches are monitored to ensure compliance with state water quality standards. Marine waters are analyzed for the presence of the fecal bacteria Enterococci. Enterococci are known as indicator organisms, meaning their presence may indicate the presence of other pathogenic organisms. The state standard for Enterococci at coastal public beaches is 104 counts/100 ml of water in one sample. The protocol for issuing coastal beach advisories was implemented in 2003 with the establishment of the formal coastal Beach Program in New Hampshire. According to protocol, when either two or more samples collected at a beach exceed the standard or when one sample exceeds 174 counts/100 ml, a beach advisory is issued. At that time, the advisory is posted on the beach website, beach managers are notified, and signs are placed at the entrances to the beach to warn the public of the potential health threat posed by water contact at the beach. Beach advisories remain in effect until subsequent beach sampling reflects results below the state standard.

The 2010 sampling season began June 1. The summer sampling season encompassed 92 days. Sampling at coastal beaches concluded on September 1. Precipitation was recorded on 35 days during the summer sampling season, based on amounts recorded at the Seabrook Power Station. Wetfall during the June sampling totaled 1.83 inches. July and August yielded 2.1 and 4.65 inches of wetfall respectively.

Twenty eight routine inspections were conducted at Hampton Beach during the 2010 swim season. One hundred fifteen samples were collected and tested for Enterococci (Table 2). Overall, the 2010 summer Enterococci levels were very low and within the state's standards for Hampton Beach (Figure 2). Of the 165 samples collected, only 8 were higher than 10 counts of Enterococci/100 ml of water with the highest being 30 counts.

There are no significant concerns regarding water quality at Hampton Beach State Park. Of the 918 samples collected at Hampton Beach State Park since 2003, only 6 have exceeded the state standard which is a small portion of the total violations measured at all NH coastal beaches (Figure 3).

State Park management was once again proactive in removing trash and maintaining sanitary conditions at the beach. The Adopt-a-Beach Program continued throughout the 2010 season and was successful in performing monthly beach clean-ups. Maintaining a clean beach is an effective way to reduce waterfowl and associated fecal matter while reducing bacteria levels in the water.

Table 2. Hampton Beach State Park 2010 Enterococci Data
Data collected during inspections of Hampton Beach State Park in 2010.
(*) indicates mean value from the routine and duplicate sample collected at the station

Date	Enterococci (count/100 ml)					Inspection Type	Previous 24 hours rainfall (inches)	Number of bathers	Animal Presence
	Left	Left Center	Center	Right Center	Right				
6/2/10	<10	<10	<10	<10	<10	Routine	0.01	23	75 birds
6/3/10	<10	<10*	<10	<10	<10	Routine	0	1	3 birds
6/7/10	<10	<10	<10	<10	<10	Routine	0.41	13	70 birds
6/9/10	<10	<10*	<10	<10	<5	Routine	0	14	83 birds
6/15/10	<10	<10*	<10	<10	<10	Routine	0.01	33	10 birds
6/17/10	10	<10*	<10	<10	<10	Routine	0.07	27	26 birds, 1 dog
6/23/10	<10	20	<10	<10	<10	Routine	0	161	39 birds
6/24/10	<10	<5	<10	<10	<10	Routine	0.29	214	23 birds
6/28/10	20	30	<10	<10	<10	Routine	0.07	179	19 birds
6/29/10	20	<10	<5	<10*	<10	Routine	0	111	29 birds
7/6/10	<10	<10*	10	<10	<5	Routine	0	418	2 birds
7/7/10	<10	<10	<10	<10	<10	Routine	0	574	2 birds
7/13/10	<10	<10	10	<10	20	Routine	0.02	164	31 birds
7/14/10	<10	7.5*	<10	<10	<10	Routine	0.04	1	19 birds
7/19/10	<10	<5	<10	<10	<10	Routine	0.09	268	23 birds
7/21/10	10	10	<10	5	<10	Routine	0	516	0 birds
7/26/10	10	<10	10	<10	<10	Routine	0	291	62 birds
7/27/10	10	7.5*	10	<10	<10	Routine	0	255	2 dogs, 43 birds
8/3/10	<10	10	<10	10	<10	Routine	0.01	474	30 birds
8/5/10	<10*	<10	<10	<10	<10	Routine	0.01	73	5 birds
8/11/10	30	<10	<5	10	<10	Routine	0.07	380	0
8/12/10	20	<10	<10	<10	<10	Routine	0.03	46	12 birds
8/18/10	<10	<10	<10	<10	<10	Routine	0	125	15 birds
8/19/10	<10	<10*	<10	<5	<10	Routine	0	136	21 birds
8/23/10	<10	<10	<10	<10	<10	Routine	0.08	0	31 birds
8/25/10	10	<10	<10	<10	20	Routine	0.50	0	0
8/30/10	<10	<10	<10	<10	<10	Routine	0.01	205	50 birds
9/1/10	<10	<10	<10	<10	<10	Routine	0	273	46 birds

Observations and Recommendations

- Hampton Beach State Park is under excellent management and is a role model for coastal beaches. We applaud DRED for their diligent efforts to maintain a safe and healthy beach environment. The NH Beach Program intends to continue the productive cooperative effort with the NH State Beaches to make the beaches cleaner and safer for all visitors.
- Results from beach clean up activities indicate that fireworks casings are often found littering the beach. Weekly firework displays are set off from the main beach area. The DES recommends an alternate location to hold weekly fireworks displays. One area that may be considered is the southern end of Hampton Beach at the State Park quarters. There is a large gravel/grass visitors parking area that might facilitate a fireworks displays.

Hampton Beach Adopt-a-Beach Program

In response to growing concern over the amount of litter and marine debris impacting visual and environmental aspects of Hampton Beach, the beach program partnered with the Blue Ocean Society for Marine Protection (BOS) from Portsmouth, N.H. Both parties met to discuss the development of an Adopt-a-Beach Program at Hampton Beach in the spring of 2005. A formal Memorandum of Agreement stated that the Blue Ocean Society would add Hampton Beach to their Adopt-a-Beach Program and that the beach program would supply materials such as gloves, garbage bags, scales and pencils to volunteers who clean Hampton Beach.

In the fall of 2009, the Memorandum of Agreement between the DES and the BOS was revised to acknowledge the 16 mainland coastal beaches monitored by DES and divided into 22 sections available for adoption through the BOS. Previously, only five sections at Hampton Beach State Park were recognized. Currently, 19 sections are adopted including three of the five sections at Hampton Beach.

Hampton Beach is in excess of 1 mile long and a single group of volunteers could not be expected to scour the entire beach length. The beach has been divided into five ¼ mile sections, Sections A through E (Figure 4), so volunteer groups are able to handle the litter that accumulates on the beach. In 2010, three adopted sections of Hampton Beach were cleaned throughout the year by volunteers. The two remaining sections were subject to opportunistic clean ups.

Two groups are recognized for cleaning sections of Hampton Beach State Park: Calling All Crows/UNH Climbing Team and Linda Clark and Linda Rickenbach. In 2010, cigarette butts accounted for 75% of the total trash collected at Hampton Beach. Over the course of 25 clean up events, 1,283 pounds of trash were collected. The BOS produces an annual summary of clean-ups and litter collected at coastal areas in New Hampshire and Maine. The 2010 report will be available for downloading in early 2011 on the BOS website: **www.blueoceansociety.org/Research/pollution_research.html**.

Please contact Sonya Carlson, beach program coordinator, or Jen Kennedy, (603) 431-0260 or **jen@blueoceansociety.org** for information about adopting orphaned beach sections.

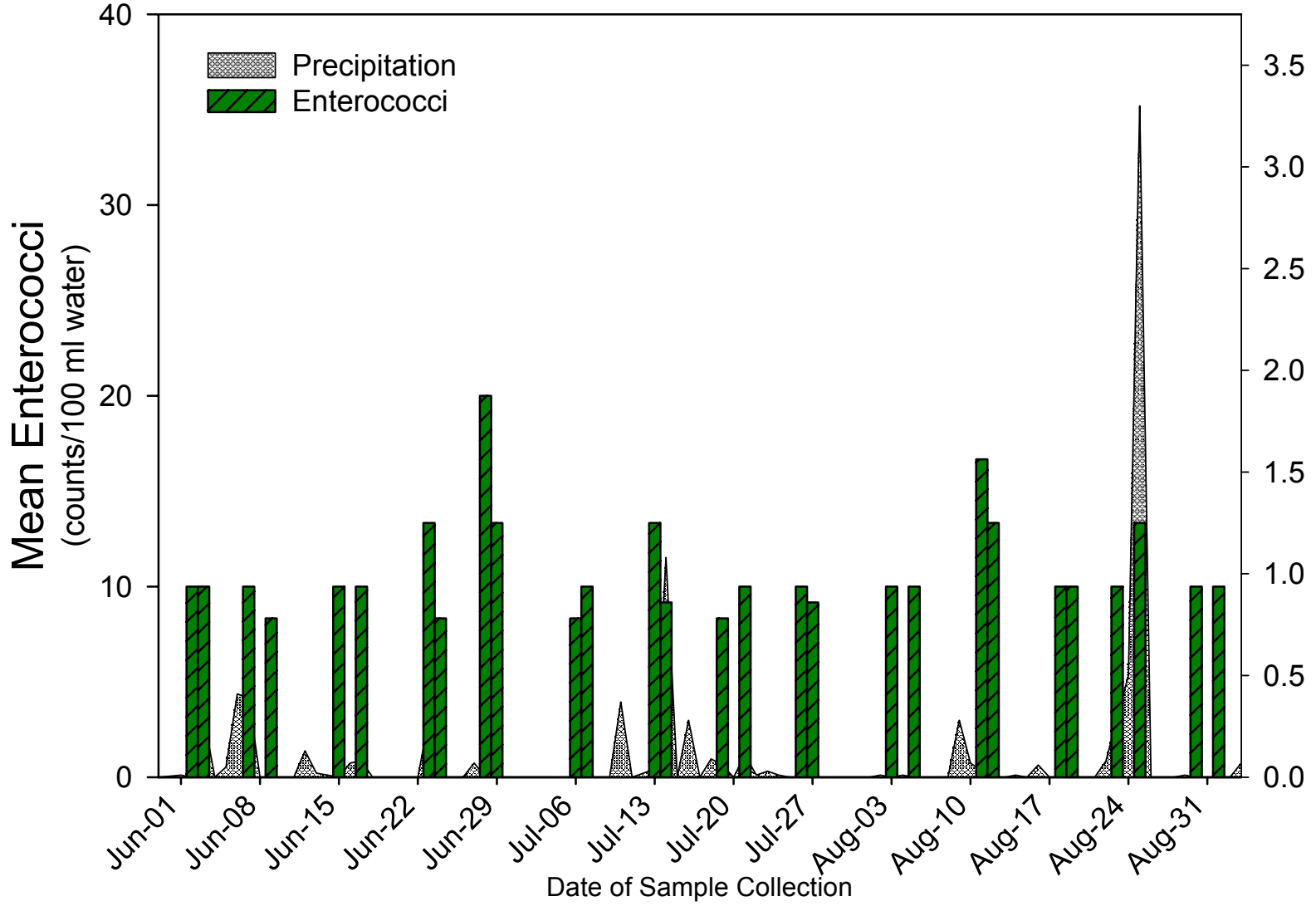

Figure 2. Hampton Beach 2010 Enterococci Data. Enterococci values are the means of the five samples collected at the beach during each inspection. No samples were above the state standard of 104 counts of Enterococci/100 ml of water in 2010 so no advisories were posted. See Table 2 for all results from all stations for the 2010 sampling season.

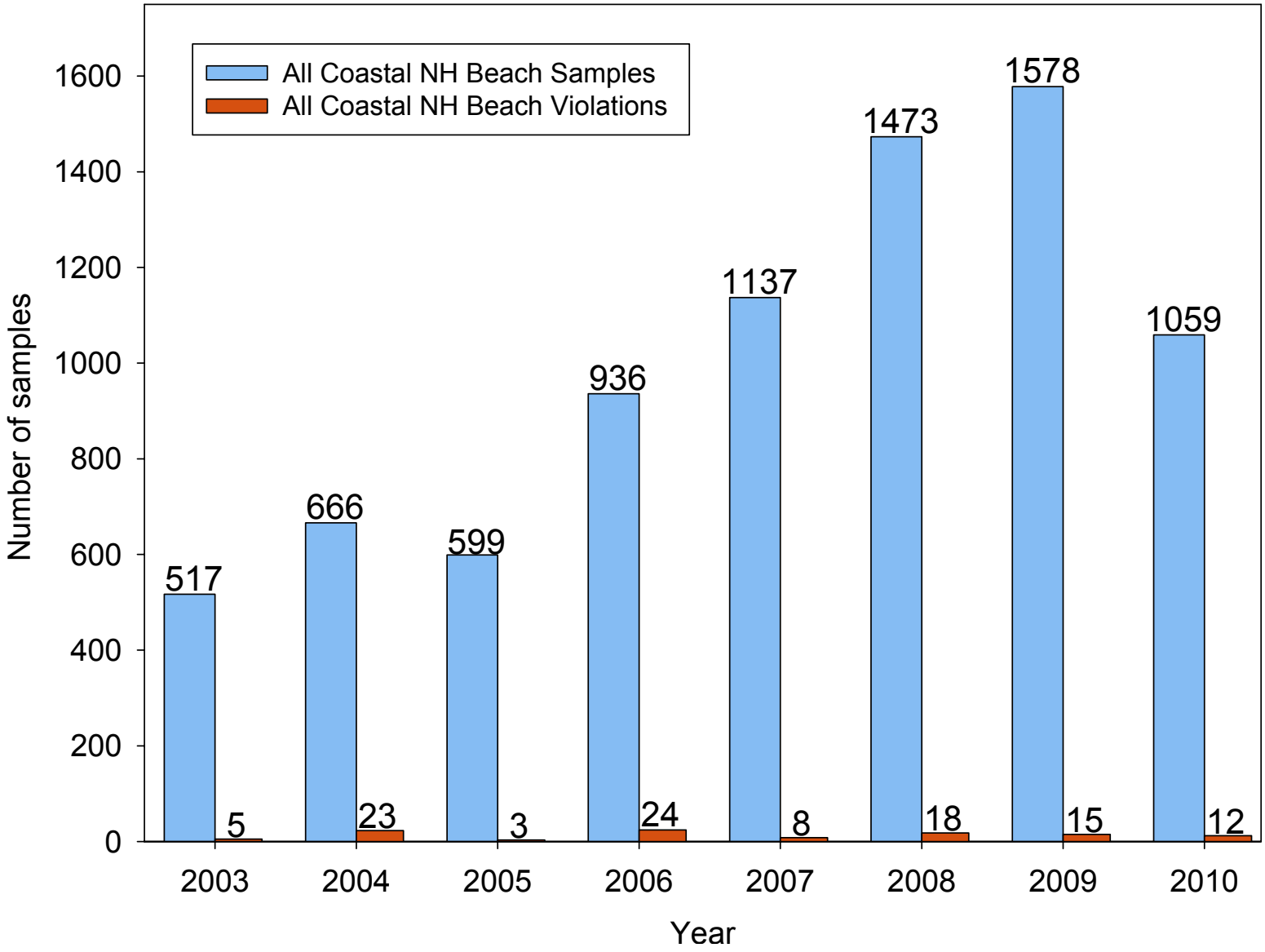

Figure 3. Annual samples collected and violations recorded at all coastal beaches. An exceedence of the state bacteria standard is a violation. Hampton Beach State Park has only had five violations since the beach evaluation and advisory protocols were implemented in the 2003 sampling season. All five violations were recorded in 2004 during the swim season and no advisories were posted.

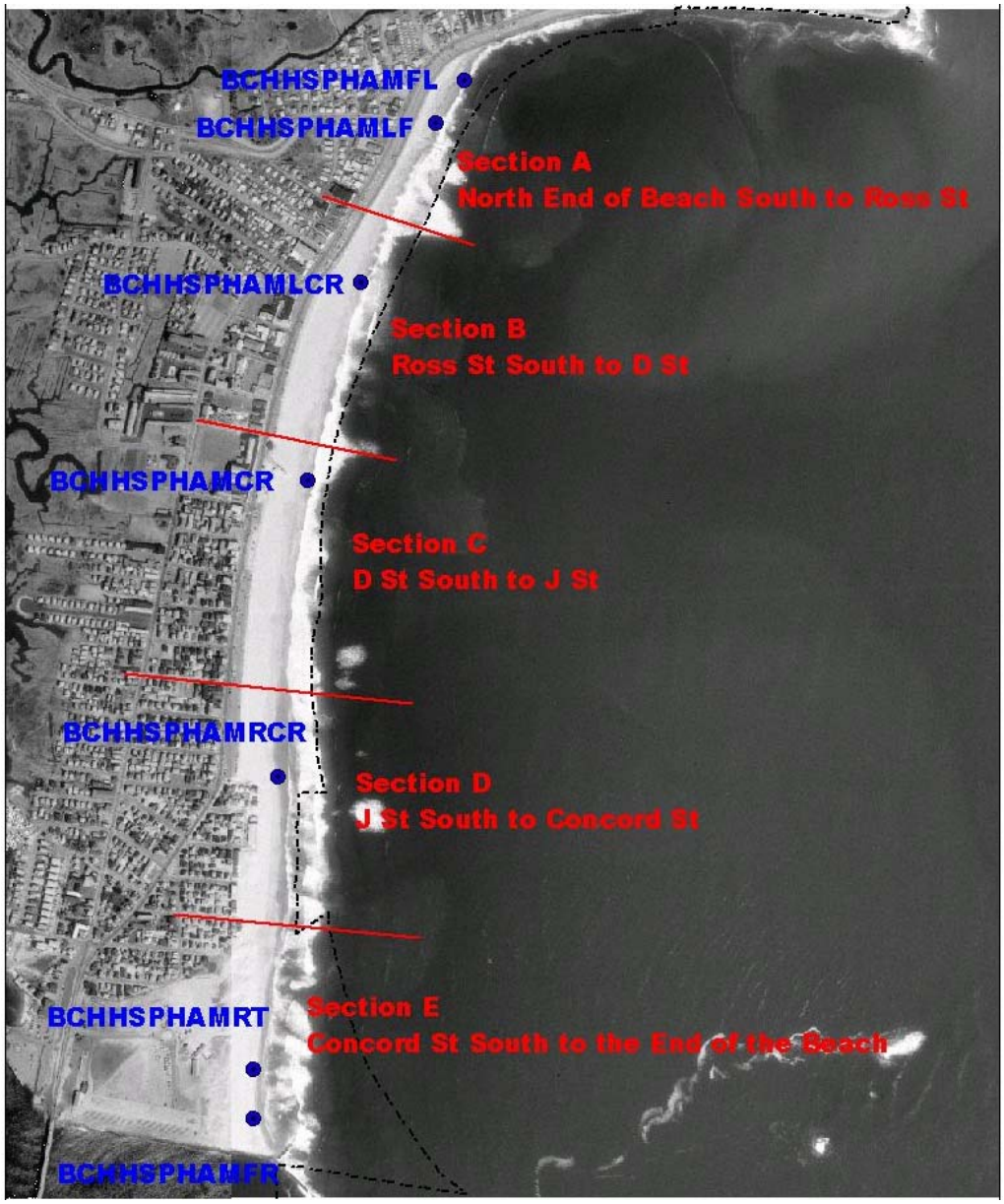

Figure 4. Hampton Beach Adopt-a-Beach Sections

Flagship Beach Accomplishments

The Clean Beaches Initiative was launched in 2002 with Flagship Beach nominations and recognition. The 2010 season marked the eighth year of Flagship Beach monitoring. The DES beach program continues to work cooperatively with Hampton Beach State Park to protect public health for those recreating at the beach. Accomplishments in 2010 include:

- Risk-based beach evaluations are conducted annually to identify potential bacteria sources to the beach, assess beach use, and determine beach importance to residents and the local economy.

- As previously mentioned, an Adopt-a-Beach Program continues at Hampton Beach State Park. The Blue Ocean Society coordinates volunteer clean up activity at adopted beach sections.

- The National Resources Defense Council (NRDC), a national environmental action organization, recognized Hampton Beach State Park with a five star rating in its annual report "Testing the Waters." Nineteen of the 359 most popular beaches across the United States received a five star rating. The rating recognition is awarded for beaches with less than 5% of the bacteria samples exceeding standards, frequent sampling, and speedy reporting of results and advisories to the public[1].

- The DES Beach Program continues to coordinate an education campaign concentrating on decreasing cigarette litter. Pocket ashtrays are available for distribution.

Future Goals

The DES beach program, Hampton Beach State Park, and the Town of Hampton will combine efforts to promote healthy beach quality at Hampton Beach State Park. Future Flagship Beach goals include:

- Continue to promote the installation of the updated beach *Monitored* signs at all access points for Hampton Beach State Park.
- Collect the GPS coordinates of all *Monitored* signs to provide park management with a guide to where advisory sign postings are required during a beach advisory event.
- Coordinate outreach for lifeguards to outline Beach Program advisory protocol during an advisory event.
- Coordinate future education campaigns with the State Park to prevent litter accumulations.

Appendix: Special Topic 2010 – New Hampshire is First in Beach Water Quality

The water quality at coastal New Hampshire beaches was recognized by the National Resources Defense Council (NRDC) as one of the best coastal beaches in the United States for 2010. New Hampshire Public Coastal Beach water bacteria results were compared to results from coastal and Great Lake beaches in the United States and its territories. Less than 1% of the 1,712 samples collected at coastal New Hampshire beaches exceeded the NH Designated Public Beach bacteria standard. In addition to recognizing all NH coastal waters, the NRDC recognized both Hampton Beach State Park and Wallis Sands at Wallis Road with a five star rating for less than 5% of the bacteria samples exceeding standards, frequent sampling, and speedy reporting of results and advisories to the public[1]. Of the 359 popular beaches rated in the United States, only 19 received a five star rating.

The NRDC is "an international nonprofit environmental organization with more than 1.3 million members and online activists. Since 1970, [NRDC] lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment."[2]

Also highlighted by the NRDC report was New Hampshire's low percentage of violations since 2006. In 2006, only 3% of samples collected exceeded the state standard for designated public beaches. In all subsequent years, only 1% of samples collected surpassed the state water quality standards. In 2010, violations were recorded in only 12 of the 1,155 samples collected at coastal beaches.

Funded by the EPA BEACH Act grant, DES samples, monitors and provides timely reporting for all designated public beaches. The top water quality assessment and five star ranking of New Hampshire coastal beaches demonstrates how well New Hampshire residents, local town officials and state organizations work cooperatively to keep our beaches and coastal waters clean. New Hampshire residents should be proud of our coastal beach water quality and strive to maintain these levels. Currently, the DES Beach Program is completing management plans for two coastal watersheds. Management plans will contain specific recommendations regarding septic systems, pet waste, and other sources to reduce bacteria loads at tidal beaches. Cooperative efforts will identify pollution sources, determine sources of contamination, and then develop and implement bacteria management plans to reduce beach pollution.

By following these 4 simple steps everyone throughout the coastal watershed can work to minimize beach pollution:

- Pick up and dispose of pet waste properly
- Maintain septic systems
- Put swim diapers with plastic covers on babies
- Keep trash off the beach

Together, everyone can work to maintain New Hampshire's top rated beaches.

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[1] NRDC: Testing the Waters 2010 website. Accessed December 14, 2010, http://www.nrdc.org/water/oceans/ttw/200beaches.asp

[2] M. Dorfman and K.S. Rosselot. Testing the Waters: A Guide to Water Quality at Vacation Beaches Twentieth Annual Report. July 2010